

SUBORBITAL SCIENCE MISSIONS OF THE FUTURE

July 13-15, 2004

Location: Key Bridge Marriott Hotel, Rosslyn, Virginia

**Sponsored by: NASA Earth Science Enterprise, Suborbital Systems
Division**

Purpose and Outcome

- Develop innovative mission concepts and system requirements for each of six Earth Science focus areas to guide new investments in suborbital systems development

Meeting Agenda

Tuesday, July 13 – 8:00am – 5:00pm

8:00am – continental breakfast

8:30am

Opening: Cheryl Yuhas kicks off the meeting with a review of purpose and outcomes. Cindy Zook and John Riordan review the meeting design and groundrules. Participants introduce themselves in their respective groups.

Context: Key leads provide a brief overview of the suborbital science environment:

- **Aeronautics** – Dr. Vic Lebacqz, AA for Code R
- **Earth Science** – Dr. Ghassem Asrar, AA for Code Y
- **Directed Studies** – Steve Wegener, ARC
- **Progress reports by 3 directed study teams**

Key Science Questions: Working in focus area workgroups, participants review current roadmaps and define the critical science questions most appropriate for the suborbital platform realm in their assigned ESE science focus area..

- *Given what we have heard about UAV potential, should any of the existing 2010-2015 Roadmap initiatives become SUBORBITAL?*
- *Are there other things that should be in the Roadmap now that we see what is possible?*
- *How would we prioritize the questions in our ESE science focus area that are most suitable for the suborbital platform realm?*

Networking Lunch

System Requirements and Mission Concepts: Randy Albertson and Steve Wegener review the template and analysis process. Working in focus area workgroups, participants define observation / measurement requirements and mission concepts for one of the priority science questions and prepare to report out results to the larger group the following morning.

Observation / Measurement Definition:

- *For each priority science question, what do we want to observe or measure? How would we describe the phenomena we want to measure?*
- *How does this observation or measurement support this ESE science focus area?*

Observation / Measurement System Requirements:

- *How specifically do we want to observe or measure it?*
- *What are the instrument / payload characteristics (type, weight, volume, environmental considerations, and access such as sampling or viewing ports)?*
- *What are the flight characteristics (location, altitude, endurance, season, frequency)?*
- *What are the communications needs (such as real-time data or instrument control)?*

Mission Concept:

- *What are the key elements of the mission concept? Describe a measurement approach. Provide a narrative describing a “day-in-the-life” of this mission. Provide a diagram showing flight profile in time, space and/or geographic coordinates. Identify any special or unique platform or mission issues.*

5:30pm – 6:30pm – Reception/No-host bar

Wednesday, July 14 – 8:00am – 5:00pm

8:00am – continental breakfast

8:30am

Report Outs: Focus area workgroups report out the results of their work from the previous day for one of the science questions. Participants discuss observations and confirm that all groups are headed in the right direction.

System Requirements and Mission Concepts: Participants continue fleshing out system requirements and mission concepts for the other critical science questions in their focus area.

Working Lunch

Continue with system requirements

Thursday, July 15 – 8:00am – 12:00pm

8:00am – continental breakfast

8:30am

System Requirements and Mission Concepts: Participants finish fleshing out system requirements and mission concepts for their final critical science question.

Highlights: Participants discuss in their focus area groups and then report highlights from the planning process to the entire group.

- *What are the highlights that emerged the past two days from our work?*

Next Steps & Follow Up: Cheryl Yuhas reviews the next steps in the planning process and participants provide input.

- *How do we stay involved in and support the planning process?*
- *As a result of this workshop, what are the key messages we want to deliver to the rest of our science community? To other key stakeholders?*

Wrap-up: Participants critique the meeting and close out with one another.

System Requirements Template

Critical Science Question:

Observation / Measurement Definition: Describe the phenomenon you want to observe. Describe what you need to measure.

Explicitly state how this observation and measurement supports this ESE science focus area. Explicitly state the advantage of using a suborbital platform for this measurement.

Observation / Measurement System Requirements: Describe how you want to observe or measure the phenomena. Consider the following:

- Instrument / Payload characteristics (type, weight, volume, environmental considerations, and access such as sampling or viewing ports)
- Flight characteristics (location, altitude, endurance, season, frequency). Discuss number of platforms, formation flying, or other special flight characteristics.
- Communication needs such as real-time data or instrument control

Mission Concept: Describe in as much detail as possible the measurement approach:

- Provide a narrative describing a “day-in-the-life” of the mission.
- Develop a diagram showing flight profile or maneuvers in time, space and/or geographic coordinates.
- Identify any special or unique platform or mission issues.
- Summarize the key elements of the mission concept for this measurement.